



PATENT APPLICATION

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PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Yasuo YAMAMOTO et al.

Application No.: 09/963,546

On Appeal from Group: 2673

Examiner: N. Patel

Filed: September 27, 2001

Docket No.: 110704

For: IMAGE DISPLAY MEDIUM AND IMAGE FORMING APPARATUS

APPEAL BRIEF TRANSMITTAL

Commissioner for Patents  
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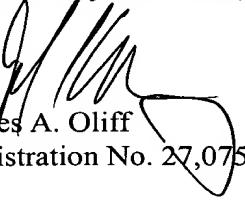
Sir:

Attached hereto is our Brief on Appeal in the above-identified application.

Also attached hereto is our Check No. 163722 in the amount of Five Hundred Dollars (\$500.00) in payment of the Brief fee under 37 C.F.R. 1.17(c). In the event of any underpayment or overpayment, please debit or credit our Deposit Account No. 15-0461 as needed in order to effect proper filing of this Brief.

For the convenience of the Finance Division, two additional copies of this transmittal letter are attached.

Respectfully submitted,

  
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BRIEF ON APPEAL

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Appeal from Group 2673

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Application No. 09/963,546

I. REAL PARTY IN INTEREST

The real party in interest for this appeal and the present application is Fuji Xerox Co., Ltd., by way of an Assignment recorded in the U.S. Patent and Trademark Office at Reel 012214, Frame 0893.

II. STATEMENT OF RELATED APPEALS AND INTERFERENCES

There are no prior or pending appeals, interferences or judicial proceedings, known to Appellant, Appellant's representative, or the Assignee, that may be related to, or which will directly affect or be directly affected by or have a bearing upon, the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 1-9 are on appeal.

Claims 1-9 are pending.

No claims are allowed.

Claims 1-9 are rejected.

IV. STATUS OF AMENDMENTS

No Amendment After Final Rejection has been filed. A Request for Reconsideration After Final Rejection was filed on July 29, 2004. The November 2, 2004 Advisory Action indicated that this Request for Reconsideration was considered by the Examiner, but was found not to place the application in condition for allowance.

## V. SUMMARY OF CLAIMED SUBJECT MATTER

The claimed subject matter relates to an image display medium capable of repetitive rewriting. Image display mediums such as twisting ball display, electrophoresis, magnetic phoresis, thermal rewritable medium and liquid crystal displays, are known in the art. However, while these techniques have excellent memory properties, the surfaces of the image display mediums employing these techniques cannot provide a white display face such as paper and the density contrast is low. See page 1, lines 8-14 of the specification.

An image display apparatus according to one embodiment is shown in Figure 1 of the specification. At least two or more kinds of particles (22, 24) are sealed in a space between a pair of facing substrates (8, 18). In preparing the display medium, the different particles are mixed and stirred until frictional charging occurs between the particles themselves and between particles and the inner walls. See page 6, lines 1-7 of the specification. Due to this frictional charging, at least one kind of particles is charged positively, while at least one kind of other particles is charged negatively. These particles are then sealed between the substrates. See page 6, lines 6-7 of the specification. Then, when an electric field is applied in accordance with image signals during operation of the display medium, the positively charged particles and the negatively charged particles are separated and moved in accordance with the electric field and are deposited to different substrates. See page 6, lines 22-24 of the specification. Manipulation of the applied electric field permits images to be displayed with the medium.

### A. Independent Claim 1

Claim 1 is directed to an image display medium, for example as described above. The image display medium comprises a pair of facing substrates and at least two kinds of differently colored particles, at least one of which is positively chargeable and at least one of which is negatively chargeable, sealed in a space between the pair of substrates. Further, a

charge controller is internally added to one or both of the particles that are positively or negatively chargable.

Charge controllers are a chemical generally capable of generating positive or negative charges to the surface of particles by friction and controlling the magnitude of the charged amount, speed for the generation of charges, charge retainability and uniformness for the charge distribution of particles by addition to the particles. See page 10, lines 12-16 of the specification. For example, the chemical structure of the charge controller for positive charging can include chemicals having electron donating properties or of a quaternary ammonium salt structure. See page 10, lines 16-18 of the specification. The chemical structure of the charge controller for negative charging can include chemicals having electron attracting groups or of an organic metal chelate structure. See page 10, lines 18-20 of the specification.

These charge controllers are internally added to the particles. By this is meant that the charge controllers are distributed within the particle, as opposed to merely being on an external surface of the particles. The process for making a white particle is set forth in the specification on pages 19-20. This process clearly describes the manner in which the particle is made with the charge controller as part of the particle, i.e., as internal to the particle itself. Furthermore, as shown in Figure 2 of the present specification, the charge controller (23) is internal to the particle (24).

The charge controller is thus an integral part of the particle, and not simply a surface additive on the external particle surface. One benefit of internally adding the charge controller is that it is effective for stabilizing the charge amount due to the frictional charging between each of the particles. See page 3, lines 14-16 of the specification.

When the charge controller is deposited externally onto the particle surface so as to be only an external additive, the charge controller can transfer to the surface of the other particles. See page 4, lines 5-11 of the specification. Thus, by internally adding the charge controller, the

image display exhibits less change in the image density, less change of the density uniformness, and stable density contrast even with repetitive writing over a period of time. See page 4, lines 5-11 of the specification.

B. Independent Claim 5

Claim 5 is also directed to an image display medium. The image display medium comprises a pair of facing substrates and at least two kinds of differently colored insulative non-magnetic fine particles. Each of the fine particles have frictional chargeability between each other. An electric field generation unit provides an electric field to the insulative non-magnetic fine particles and frictionally charges the fine particles to polarities different from each other.

At least two or more particles are mixed and stirred. It is believed that frictional charging occurs between the particles and between the particles and the inner wall of the container during the mixing and stirring process. The mixed particles are sealed in a space between the pair of substrates. The particles move between the substrates in accordance with the electric field generated by the polarity switching of a DC voltage or application of an AC voltage between the pair of substrates, i.e., the initializing step. See page 6, lines 1-13 of the specification.

This frictional charging produces at least one kind of positively charged particles and least one kind of negatively charged particles. While the positively charged and negatively charged particles tend to adhere to each other, application of the electric field during the initializing step deposits the two differently charged particles onto the two separate substrates. See page 6, lines 14-21 of the specification.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The following grounds of rejection are presented for review:

The following grounds of rejection are presented for review:

- 1) Claims 1-4 and 9 are rejected as anticipated under 35 U.S.C. §102(e) by U.S. Patent No. to 6,113,810 to Hou et al. ("Hou");
- 2) Claims 5-8 are rejected as having been obvious under 35 U.S.C. §103(a) over Hou in view of U.S. Patent No. 5,411,398 to Nakanishi et al. ("Nakanishi").

## VII. ARGUMENT

### A. Claims 1-4 and 9 Are Not Anticipated By Hou

Claims 1-4 and 9 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by U.S. Patent No. 6,113,810 (hereinafter "Hou"). The Examiner alleged that Hou shows an image displaying medium that comprises a charge controller that is internally added to one or both of the particles. Appellants respectfully disagree.

#### 1. Hou Does Not Teach or Suggest Internal Addition of a Charge Controller to Particles of an Image Display Medium

Hou teaches an electrophoretic dispersion comprising a dielectric fluid, a set of first color particles having a selected polarity and a set of second color particles having a polarity opposite that of the first set of color particles. See the Abstract. Hou teaches that each set of particles is made to have a different functional monomer on a surface thereof, thereby adding particles with a different surface functionality that associates with a respective charge control agent in a dielectric fluid, thereby achieving the desired charge in the particles. Hou teaches that to form an electrophoretic dispersion containing two types of particles with different colors and opposite charges, surfactants are selected to include in the dispersion fluids so as to charge the two different types of particles either positively or negatively. See column 4, lines 1-6 of Hou. The particles are transferred from their dispersion mediums to a desired dielectric medium by a washing process. See column 5, lines 65 through column 6, line 1 of Hou. The solvent washed particles are then redispersed in a dielectric medium with the addition of a desired charge control agent. See column 6, lines 6-9 of Hou.

It is unclear whether the Examiner refers to the surfactant or the charge control agent as equivalent to the charge controller. Regardless, whether the surfactant or the charge control agent of Hou is considered the charge controller, neither the surfactant nor the charge control agent is internally added to the particle. The surfactant is added to the external surface of the particle to form a functional monomer. The charge control agent is added to

the fluid in which the particles are dispersed, and thus at best, merely associates with the external surface of the particles. The surfactants and charge control agents are not internal parts of the particles themselves.

It is thus clear that any charge controllers in Hou are at best external to the. Nowhere does Hou teach or suggest an image display medium that includes therein at least two kinds of particles wherein a charge controller is internally added to one or both of the particles.

2. Claim 1 is Clear Regarding Internal Addition of the Charge Controller

The Examiner has indicated that claim 1 is unclear as to the charge controller and the manner in which it is internally added. See the November 2, 2004 Advisory Action. As explained above, charge controllers are a chemical generally capable of generating positive or negative charges to the surface of the toners by friction and controlling the magnitude of the charged amount, speed for the generation of charges, charge retainability and uniformness for the charge distribution of particles by addition to the particles. See page 10, lines 12-16 of the specification. Further, the specification describes what is meant by internal distribution, as opposed to external surface addition, and includes a specific example illustrating internal addition of the charge controller to a particle as recited in claim 1. In particular, the internally added charge controller is part of the particle, i.e., is part of the toner binder resin. The process described in detail above and on pages 19-20 of the specification clearly describes the manner in which the charge controller is internally added. The charge controller is an integral part of the particle, and not simply a surface additive. The Examiner's assertion on lack of clarity is thus not correct.

Claim 1 of the present application specifically recites "a charge controller is internally added to one or both of the particles." By internally adding the charge controller, problems such as lowering of the charged amount by the transfer of the fine particles to the mating particles, and transfer to the transparent electrode substrate and lowering of the display

contrast due to the change of the powder flowability, are avoided. See page 8, lines 4-9 of the specification. The charge controller being internally added to one or both of the particles as recited in claim 1 is clearly different than Hou's disclosure.

In the Advisory Action, the Examiner alleged that the drawings do not demonstrate an internally added charge controller. However, Figure 2 of the present specification clearly shows that the charge controller (23) is internal to the particle (24). (23) is clearly pointed to the inside of the particle (24) and not the surface of the particle (24). If the charge controller (23) was on the surface of the particle (24), the indicating line would have been drawn to the edge of the particle and not to the center of the particle.

3. Conclusion

For the foregoing reasons, Hou does not teach or suggest a charge controller that is internally added as in the recited claims 1-4 and 9. Accordingly, the Examiner's position that Hou anticipates claim 1, and claims 2-4 and 9 dependent therefrom, is not supported. Further, the Examiner's contention that an internally added charge controller is not clear also is clearly incorrect in view of the specification description discussed herein.

B. Claims 5-8 Would Not Have Been Obvious Over Hou in View of Nakanishi

Claims 5-8 were rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Hou in view of U.S. Patent No. 5,411,398 (hereinafter "Nakanishi"). The Examiner asserted that Hou discloses a pair of facing substrates, and at least two particles, each having a single color. However, the Examiner also admitted that Hou does not teach a non-magnetic particle having frictional chargeability. The Examiner claims that Nakanishi shows a non-magnetic particle having frictional chargeability, and thus that it would have been obvious to use the non-magnetic particles of Nakanishi in the Hou image display.

1. References Would Not Have Been Combined As Alleged

Contrary to the Examiner's assertion, the suggested combination would not have been made by one of ordinary skill in the art as no suggestion is made in either Hou or Nakanishi for combining these references. Nakanishi teaches a magnetic display system wherein a magnetic field causes the shift of the magnetic particles toward the back surface of the display while the non-magnetic particles shift toward the front surface of the. See column 8, lines 8-13 of Nakanishi.

Hou, on the other hand, does not utilize a magnetic system, and thus one would not have been motivated to look to Nakanishi to combine with Hou. As explained above, Hou teaches to form an electrophoretic dispersion containing two types of particles with different colors and opposite charges, and in which surfactants and charge control agents are selected to charge the two different types of particles either positively or negatively. The particles' orientation in the fluid is controlled via application of an electric field.

As Hou utilizes an electric field to operate the display and Nakanishi uses a magnetic field, one would not have looked to have combined the references with respect to the particles used in the very different display mediums. Nothing in Nakanishi suggests applicability of the particles therein in the display medium of Hou that operates differently (electrically) from the Nakanishi display medium (magnetically). The references provide no motivation for the use of Nakanishi's magnetically operable particles in the electrically operable display medium of Hou.

2. The Rejection is Based on Improper Hindsight/Picking and Choosing

Even if one had considered Hou and Nakanishi together, such teachings would not have led one to the subject matter of claim 5. As above, Hou operates using an electric field in an electrophoretic image display whereas Nakanishi operates using a magnetic field in a magnetic display system. While Nakanishi certainly does describe the use of insulative non-

magnetic particles in the display, such are used in combination with magnetic particles so as to be separately manipulatable when a magnetic field is applied.

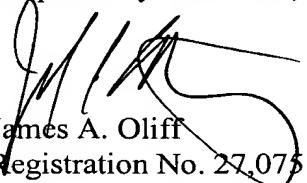
The Examiner has alleged one would have taken only the non-magnetic particles from Nakanishi and included such particles in Hou. However, as Hou and Nakanishi operate their respective display mediums on completely different principles, as discussed extensively above, such selective picking and choosing from Nakanishi is clearly not based upon any teachings in either Hou or Nakanishi. Instead, it is clear that the selective picking and choosing of Nakanishi's non-magnetic particles by the Examiner is based solely on improper hindsight.

Therefore, Appellants believe that claims 5-8 are allowable over Hou in view of Nakanishi. Appellants submit that the selective picking and choosing of Nakanishi's non-magnetic particles by the Examiner is clearly based solely on improper hindsight. The references themselves provide no motivation or teaching to direct one to the selective combination alleged by the Examiner.

VIII. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claims 1-9 are in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejections of claims 1-9.

Respectfully submitted,



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CLAIMS APPENDIX

CLAIMS INVOLVED IN THE APPEAL:

1. An image display medium comprising:
  - a pair of facing substrates; and
  - at least two kinds of particles sealed in a space between the pair of substrates,
  - wherein the at least two kinds of particles, each having only a single color, have a characteristic that at least one kind of them is positively chargeable and at least one other kind of them is negatively chargeable, and the particles chargeable positively and negatively are of colors different from each other, and a charge controller is internally added to one or both of the particles chargeable positively and negatively.
2. The image display medium according to claim 1, wherein the charge controller is colorless, of less coloring capability or of a hue similar to that of the entire particles contained.
3. The image display medium according to claim 1, wherein one of particles chargeable positively and negatively is white.
4. The image display medium according to claim 3, wherein the white particles contain a colorant and the colorant is titanium oxide.
5. An image display medium comprising:
  - a pair of facing substrates;
  - at least two kinds of insulative non-magnetic fine particles each only having a single color and also having frictional chargeability between each other disposed between the substrates; and
  - an electric field generation unit that provides the electric field to the insulative non-magnetic fine particles, the two kinds of insulative non-magnetic fine particles being fine

particles of colors different from each other and frictionally chargeable to polarities different from each other.

6. The image display medium according to claim 5, wherein the electric field generation unit comprises a pair of electrodes disposed between the pair of substrates and the fine insulative non-magnetic particles.

7. The image display medium according to claim 5, wherein the pair of substrates are insulative substrates.

8. The image display medium according to claim 6, wherein the electrode is a flat plate electrode connected with a power source.

9. An image forming apparatus for forming an image to the image display medium according to claim 1, comprising:

an electric field generation unit that generates an electric field in accordance with images disposed between the pair of substrates.

EVIDENCE APPENDIX

NONE

RELATED PROCEEDINGS APPENDIX

NONE